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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,443	07/22/2004	Chin-Yee Ng	57391US003	5326
32692	7590	12/05/2006	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY			CHU, HELEN OK	
PO BOX 33427				
ST. PAUL, MN 55133-3427			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/502,443

Applicant(s)

NG ET AL.

Examiner

Helen O. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's Amendments have been received on September 18, 2006. Claim 1 has been amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-31 in the reply filed on September 18, 2006 is acknowledged. The traversal is on the ground(s) that in each of the Groups I, II, III, the special technical feature linking the Groups are provided by at least the conformable thermal conductive bladder. Although the conformable thermally conductive bladder may have some different characteristics in Groups I and II, at least the special technical characteristic of a conformable thermally conductive bladder is common to group I, II. This is not found persuasive because the Applicant admitted that the thermally conductive bladder have different characteristics. Furthermore, the Examiner has provided the reasons for lack of unity and prior art that differentiates the special technical features in the Groups. For purposes of convenience the restriction is provided below.

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

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Group I, claim(s) 1-31, drawn to an electrochemical device where the cooling bladder has inlet and outlet ports and a heat transfer medium passing through the inlet and outlet ports to control an operating temperature of the electrochemical cell.

Group II, claim(s) 32-51, drawn to an electrochemical device where the cooling bladder having a strength sufficient to hold a pressure that maintains the electrochemical cells in a state of compression during charge and discharge cycling.

Group III, claim(s) 52-66, drawn to a method of providing cooling electrochemical device

2. The inventions listed as Groups I do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Any international application must relate to one invention only or to a group of invention so linked as to from a single general inventive concept (see MPEP 1850. As demonstrated by Verhoog (US Patent 6,296,968), at least one independent claim of the application is anticipated by or obvious in view of the prior art. Specifically, the special technical feature of Group I is a product and the cooling bladder of this product has inlet and outlet ports.

The inventions listed as Groups II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Any international application must relate to one invention only or to a group of invention so linked as to from a single general inventive concept (see MPEP 1850. As demonstrated by Kaufman et al. (US Patent 4,945,010), at least one independent claim of the application is anticipated by or obvious in view of the prior art. Specifically, the special technical feature of Group II is the cooling bladder having sufficient strength to hold a pressure that maintains the electrochemical cell in a state of compression during charge and discharge cycling.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

3. The rejections under 35 U.S.C 102 (b), on claims 1-15, 17, 20-24, 27-31, as being anticipated by Verhoog are withdrawn because Applicant has amended claim 1.

Claim Rejections - 35 USC § 103

4. The rejections under 35 U.S.C 103 (a), on claims 18 and 19, as unpatentable by Verhoog are withdrawn because Applicant has amended claim 1.
5. The rejection under 35 U.S.C 103 (a), on claim 16, as unpatentable by Verhoog in view of Fitts et al. is withdrawn because Applicant has amended claim 1.
6. The rejections under 35 U.S.C 103 (a), on claims 25 and 26, as being unpatentable over Gyoten et al. are withdrawn because Applicant has amended claim 1.
7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
8. Claims 1-15, 17, 20-24, 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315).

In regards to claim 1 and 14, Verhoog teaches each of the electrochemical cells comprising opposing first and second planar surfaces (Figure 4) and being subject to volumetric changes during charge cycling (Column 1, Lines 24-25) with a unitary cooling tank (Figure 4) formed of a polypropylene tank (Column 4, Line 40) formed of plastic material (Column 2, Line 46) and having an inlet fluid orifice and an outlet fluid orifice (Column 2, Lines 34-36), the cooling bladder having a substantially flat shape (Figure 4)

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and circulates liquid between the inlet and outlet (Column 1, Lines 55-60). However, the Verhoog reference does not disclose a deformable bladder. The Brinkman et al. discloses a cooling bladder made of plastic preferably polyethylene because of its relatively good heat conductivity accompanied by high specific conductivity (Column 4, Lines 15-18). Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to incorporate a deformable (because it is a bladder) polyethylene plastic, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claims 2-7, 10 and 23, the Verhoog and Brinkman et al. teaches a cooling tank, which covers all the surface area of the electrochemical cells with continuous and hollow interior flanges (Applicant's flow channels), which the medium passes (Figure 3 and 4). The cooling tank comprises serpentine ribs (Applicant's support arrangement and thickened sections; Column 5, Line 13; Component 41) located on the outer surface and at bends of the tank that inhibits restriction of cooling medium (Figure 4).

In regards to claims 8 and 9, the Verhoog and Brinkman et al. teaches an electrolyte that fills the cells and disposed at all areas of the cell (Column 4, lines 47-49).

In regards to claims 11-13, The Verhoog and Brinkman et al. reference teaches a plurality flanges that causes the fluid flowing in the compartment to flow alternatively in the opposite direction (Column 4, Lines 35-37).

In regards to claim 15, the Verhoog and Brinkman et al. reference teaches a tank made of polypropylene material and each flange of the tank is stacked one on top of each other. Together, all the polypropylene material forms a plurality of material layer.

In regards to claim 17, the Verhoog and Brinkman et al. reference teaches the polypropylene tank which consist of ribs have the height of 3mm to 4mm (Column 5, Lines 15-16).

In regards to claim 20-22 and 27, the Verhoog and Brinkman et al. reference teaches an electrochemical assembly uniformly cooled (Column 1, Lines 44), hence, there will not be any temperature difference and the heat transfer medium entering the electrochemical cell has to be constant.

In regards to claim 24 and 28-31, the Verhoog and Brinkman et al. reference teaches a nickel metal hydride (Column 1, Line 21); it is inherent for a nickel metal hydride to operate between 20°C to 130°C. The Verhoog and Brinkman et al. reference illustrates four edges of which the cooling tank contacts (Figure 1) and a housing incorporates two orifices for each cell respectively receiving a terminal of each polarity (Column 4, Lines 45-47) and a manifold that has an inlet and outlet manifold (Figure 1).

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315).

In regards to claim 18, the Verhoog and Brinkman et al. reference discloses the claimed invention except for a plurality of cooling tanks. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality

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of cooling tanks, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. (MPEP 2144.04 VI).

In regards to claim 19, the Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein. It would have been obvious if the electrochemical cell ran for a long period of time, the heat transfer medium would be consumed and would eventually be less than 50% by volume or weight.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315) as applied to claims 1-13, 19-24, 27-31 and in further view of Fitts et al. (US 2002/015333).

The Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein, however, the Verhoog and Brinkman et al. reference does not teach a thermally conductive material comprises a metallic layer disposed between a first polymer layer and a second polymer layer. The Fitts et al. reference teaches a core material that is made of metallic, non-metallic or metallic with non-metallic materials that have a high thermal conductivity. Therefore, it would be obvious to one skilled in the art at the time the invention was made to incorporate a layer of metallic, non-metallic or metallic with non-metallic material into the heat transfer system as taught by Verhoog and Brinkman et al. to insure the system is transferring heat efficiently.

11. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent

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4,007,315) as applied to claims 1-13, 19-24, 27-31 and in further view of Gyoten et al. (US 2001/0036567).

The Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein, however, the Verhoog and Brinkman et al. reference does not teach a coolant to be water or aqueous ethylene glycol. The Gyoten et al. reference teaches water or aqueous ethylene glycol to be a coolant in order to prevent destruction of the cell by varying temperatures (Paragraph 47).

Response to Arguments

12. Applicant's arguments with respect to claim 1-31 have been considered but are moot in view of the new ground(s) of rejection.

13. Applicant's arguments filed September 18, 2006 in regards to:

a. Applicant respectfully asserts that a teaching of a temperature change is not sufficient to teach a volumetric change for an individual electrochemical cell.

If the Examiner is relying upon personal knowledge that individual electrochemical cells for an individual electrochemical cell.

In response Applicant's arguments please consider the following.

a. The Examiner is relying on a simple equation of Boyle's Law (this law is only meant for simple analogy) for support, which is well known to any individual of ordinary skill. For example, at freezing temperatures (low temperatures) water becomes ice and the volume increases when the temperature increase the ice melts to water and the volume decrease. This tells one of ordinary skill that

volume and temperature are inversely proportional. For further evidence please refer to <http://www.utdallas.edu/~parr/chm1341/1341b612.html>.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOC



TRACY DOVE
PRIMARY EXAMINER